

[NEW]

**Table 3.3-3 (REVISED, April 2003)**

**Wastewater Flows and Chemical Composition**

	<b>Denim Plant Regeneration Water (Includes Filter Backwash)</b>	<b>Equipment Drain and Washdown Oily Wastewater</b>	<b>Cogeneration Cooling Tower Blowdown</b>
<b>Average Flow (gpm)</b>	54	5	131 - <i>Note 10</i>
<b>Peak Flow</b>	300 gpm	50 gpm	400 gpm
<b>Duration</b>	1 hr / day	30 min / day	8 hrs / day
<b>General Parameters</b>			
<i>pH (pH units)</i>	6.5 – 8.5	7.0 – 7.5	8.0 – 9.5 <i>Note 13</i>
<i>Dissolved Oxygen (mg/L)</i>	8	8	8
<i>COD</i>	8 – <i>Note 1</i>	65 – <i>Note 1</i>	200 <i>Note 12</i>
<i>BOD</i>	4 – <i>Note 1</i>	33 – <i>Note 1</i>	81 <i>Note 12</i>
<i>Oil &amp; Grease (mg/L)</i>	2	20	0.3
<i>TDS (mg/L)</i>	5000	62	2200
<i>TSS (mg/L)</i>	28	20	50
<i>Temperature (°F)</i>	< 80	< 80	< 100
<b>Major Cation Conc. (mg/L)</b>			
<i>Ca</i>	54	14	207
<i>Mg</i>	20	5	77
<i>Na</i>	1688	11	165
<i>K</i>	3.6	1	14
<b>Major Anions Conc. (mg/L)</b>			
<i>HCO<sub>3</sub></i>	62	67	200
<i>CO<sub>3</sub></i>	0	0	0
<i>Cl</i>	12	3.2	287 – <i>Note 9</i>
<i>SO<sub>4</sub></i>	2950	14	1024 – <i>Note 9</i>
<b>Trace Metals Conc. (mg/L)</b>			
<i>Ag (Note 2a)</i>	0.004	0.001	0.015
<i>Al (Note 2)</i>	3.0	0.75	11.25
<i>As (Note 2a)</i>	0.004	0.001	0.24 (0.512) – <i>Note 7</i>
<i>Ba (Note 2)</i>	0.072	0.018	0.27

Source: Bechtel, Edge Analytical Test (Reference # 01-4184, 08/29/2001)

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Table 3.3-3

Wastewater Flows and Chemical Composition, continued

	Demin Plant Regeneration Water (Includes Filter Backwash)	Equipment Drain and Washdown Oily Wastewater	Cogeneration Cooling Tower Blowdown
<b>Trace Metals Conc. (mg/L)</b>			
<i>Be (Note 2a)</i>	0.004	0.001	0.015
<i>Cd (Note 2a)</i>	0.004	0.001	0.015
<i>Cr (Note 2)</i>	0.008	0.002	0.20 (0.918) – Note 7
<i>Co (Note 2a)</i>	0.02	0.005	0.075
<i>Cu (Note 2a)</i>	0.02	0.005	0.23 (0.291) – Note 7
<i>Fe (Note 2)</i>	0.308	0.077	1.16
<i>Hg (Note 2a)</i>	0.002	0.0005	0.0075
<i>Mn (Note 2)</i>	0.588	0.147	2.205
<i>Ni (Note 2a)</i>	0.004	0.001	0.015
<i>Pb (Note 2a)</i>	0.004	0.001	0.015
<i>Sb (Note 2a)</i>	0.004	0.001	0.015
<i>Se (Note 2a)</i>	0.004	0.001	0.015
<i>Sn (Note 2a)</i>	0.16	0.04	0.6
<i>Tl (Note 2a)</i>	0.004	0.001	0.015
<i>V (Note 2)</i>	0.036	0.009	0.135
<i>Zn (Note 2)</i>	0.04	0.01	2.0 – Note 9
<b>Other Anions Conc (mg/L)</b>			
<i>SiO<sub>3</sub></i>	40	10	150
<i>PO<sub>4</sub></i>	2.0	0.5	10 – Note 9
<i>F (Note 2a)</i>	2.0	0.5	7.5
<i>NO<sub>3</sub>/ NO<sub>2</sub></i>	4.0	1.0	15
<i>NH<sub>3</sub>/ NH<sub>4</sub></i>	Note 3	Note 3	Note 3
<i>Br (Note 2a)</i>	0.02	0.005	0.075
<b>Organics Conc. (mg/L)</b>			
<i>Dissolved Organic Carbon</i>	Note 4	Note 4	Note 4
<i>Polymers (polyquaternaryamine)</i>	19 – Note 5	0	0
<i>Polymers (polyacrylamide)</i>	0	0	10 – Note 8
<i>Total Organic Carbon</i>	48 – Note 6	12	50 – Note 11

Source: Bechtel, Edge Analytical test  
report (Reference # 01-4184,  
08/29/2001)

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**Notes for Table 3.3-3: Wastewater Flows and Chemical Composition**

- Note 1: Based on typical ratio between oil and grease, COD and BOD in industrial wastewaters.
- Note 2: Trace metal data reported, except Aluminum (Al), are based on a single test report by Edge Analytical (Ref 01-4184, 08/29/2001). Actual quantities will be related to background concentrations as follows:  
  
For **Denim Plant Regeneration Water (Includes Filter Backwash)**, the actual concentration will be approximately 4 times the background concentration in the Whatcom PUD water.  
  
For **Equipment Drain and Washdown Oily Wastewater**, the actual concentration will be the background concentration in the Whatcom PUD water.  
  
For **Cogeneration Cooling Tower Blowdown**, the actual concentration will be approximately 15 times the background concentration in the Whatcom PUD water.  
  
Values for Aluminum are based on historical average values as supplied by Whatcom County PUD and concentrated on the same basis as the rest of the trace metals.
- Note 2a: The Edge Analytical test showed no detectable quantity of this component. The quantities shown are based on the detection limit for the analytical test and are concentrated by 1, 4, or 15 times as described in Note 2.
- Note 3: Not detected in site samples; not normally present in surface waters at detectable levels.
- Note 4: Included with Total Organic Carbon concentration value.
- Note 5: This type of polymer may be used to treat makeup water, which is filtered prior to demineralization.
- Note 6: This is an assumed value and is based on (4) times the value typical for surface waters subject to elevated TOC due to seasonal runoff.
- Note 7: This is an estimated value, and is 15 times the value obtained in a test performed by Edge Analytical (Reference # 01-4184) plus the highest anticipated leachate rate from CCA-C wood used in cooling tower construction. This highest concentration occurs initially upon cooling tower startup. Over a period of about one year, this initial concentration would decrease about 40–80%. The number in parenthesis is the highest initial concentration; the other number in the cell is the longer-term concentration.
- Note 8: This type of polymer may be used as a dispersant in the cooling tower recirculating water.
- Note 9: This value reflects addition of this substance to the cooling tower recirculating water to control pH and limit biofouling and corrosion.
- Note 10: This value could increase to 203 GPM if the cooling tower is operated at 10 cycles of concentration as opposed to 15. Concentrations of chemical species relating to the cooling tower would then be reduced in inverse proportion. Total mass flow of species listed would remain constant. Since 10-cycle operation requires 72 gpm more make-up water on an average basis than 15-cycle operation, fresh water requirements for the Cogeneration Project in this ASC are given for 10-cycle operation.
- Note 11: This value is based on a typical average surface water TOC concentration of 3 to 4 mg/L, with the cooling tower operating at 15 cycles of concentration.
- Note 12: Based on typical ratios between TOC, COD, and BOD in municipal waste waters; which represent these relationships when the TOC, COD, and BOD are not derived from petrochemical wastes.
- Note 13: Normal control range: 8.2 to 8.8 pH

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